

FORM PTO-1390 (REV. 11-2000)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER 3241-72	
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371				U.S. APPLICATION NO. (If known, see 37 CFR 1.5 not yet known) 09/889535	
INTERNATIONAL APPLICATION NO. PCT/EP00/00368		INTERNATIONAL FILING DATE 18/JANUARY/2000		PRIORITY DATE CLAIMED 18/JANUARY/1999	
TITLE OF INVENTION WRITING INSTRUMENT WITH VARIABLY INCLINABLE TIP					
APPLICANT(S) FOR DO/EO/US Siegbert VIAL					
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:					
<p>1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.</p> <p>2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.</p> <p>3. <input checked="" type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.</p> <p>4. <input type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (Article 31).</p> <p>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)) (German Text)</p> <p>a. <input checked="" type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau).</p> <p>b. <input type="checkbox"/> has been communicated by the International Bureau.</p> <p>c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).</p> <p>6. <input type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).</p> <p>a. <input type="checkbox"/> is attached hereto.</p> <p>b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4).</p> <p>7. <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))</p> <p>a. <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau).</p> <p>b. <input type="checkbox"/> have been communicated by the International Bureau.</p> <p>c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</p> <p>d. <input checked="" type="checkbox"/> have not been made and will not be made.</p> <p>8. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).</p> <p>9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). (signed)</p> <p>10. <input type="checkbox"/> An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</p> <p>Items 11 to 20 below concern document(s) or information included:</p> <p>11. <input type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</p> <p>12. <input checked="" type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</p> <p>13. <input type="checkbox"/> A FIRST preliminary amendment.</p> <p>14. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment.</p> <p>15. <input type="checkbox"/> A substitute specification.</p> <p>16. <input type="checkbox"/> A change of power of attorney and/or address letter.</p> <p>17. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.</p> <p>18. <input type="checkbox"/> A second copy of the published international application under 35 U.S.C. 154(d)(4).</p> <p>19. <input type="checkbox"/> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).</p> <p>20. <input checked="" type="checkbox"/> Other items or information: Certificate of Express Mail EL714882070US Copy of: PCT/IPEA/409 Copy of PCT/ISA/210 Postcard</p>					

U.S. APPLICATION NO. (37 CFR 1.53) 09/889535		INTERNATIONAL APPLICATION NO. PCT/EP00/00368		ATTORNEY'S DOCKET NUMBER 3241-72	
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21. <input checked="" type="checkbox"/> The following fees are submitted: BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)): Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO. \$1000.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$860.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$710.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$690.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00 ENTER APPROPRIATE BASIC FEE AMOUNT =				CALCULATIONS PTO USE ONLY	
				\$ 1,000.00	
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	\$	
Total claims	27 - 20 =	7	x \$18.00	\$ 126.00	
Independent claims	1 - 3 =	0	x \$80.00	\$	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)				+ \$270.00	\$
TOTAL OF ABOVE CALCULATIONS =				\$	
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.				\$	
SUBTOTAL =				\$ 1,126.00	
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$	
TOTAL NATIONAL FEE =				\$	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +				\$ 40.00	
TOTAL FEES ENCLOSED =				\$ 1,166.00	
				Amount to be refunded:	\$ -0-
				charged:	\$ 166.00

a. ☒ A check in the amount of \$ 1,000.00 to cover the above fees is enclosed.

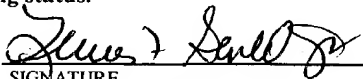
b. ☒ Please charge my Deposit Account No. 04-1679 in the amount of \$ 166.00 to cover the above fees.
 A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any
 overpayment to Deposit Account No. 04-1679. A duplicate copy of this sheet is enclosed.

d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card
 information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR
 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO: LEWIS F. GOULD, JR.
 DUANE, MORRIS & HECKSCHER
 ONE LIBERTY PLACE
 PHILA., PA 19103
 (215) 979-1282


 SIGNATURE
 LEWIS F. GOULD, JR.
 NAME
25.057
 REGISTRATION NUMBER

Docket No. 3241-72

09/889535
3518 Rec'd PCT/PTO 1 7 JUL 2001

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Application of **Siegbert VIAL**

International Application No. PCT/EP00/00368

International Filing Date: 18/JANUARY/2000

Priority Date Claimed: 18/JANUARY/1999

U.S. Serial No: not yet known

Filed: submitted herewith

For: WRITING INSTRUMENT WITH VARIABLY INCLINABLE TIP

CERTIFICATE OF EXPRESS MAIL

Assistant Commissioner for Patents
Washington, DC 20231
BOX PCT

Sir:

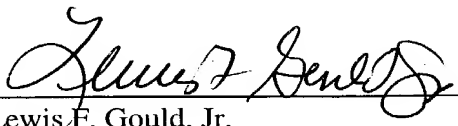
I hereby certify that this document, namely the above-identified complete U.S. National Phase Patent Application is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service on the date indicated below and are addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

"Express Mail" mailing label number EL714882070US.

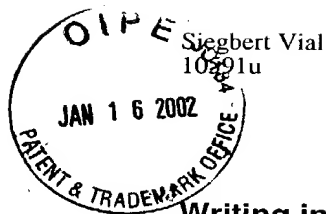
Date of Deposit JULY 17, 2001.

Respectfully submitted,

Date: July 17, 2001


Lewis F. Gould, Jr.
Registration No. 25,057
Duane, Morris & Heckscher LLP
One Liberty Place
Philadelphia, PA 19103-7396
(215) 979-1282

Docket No: **3241-72**



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Translation of PCT/EP00/00368
Description as originally filed
PTO/PCT Rec'd 16 JAN 2002

1

Writing instrument with pivotable tip

The invention relates to writing instruments which are ergonomically adapted to a user's hand posture. The term writing instruments is understood to comprise all writing
5 instruments which are adapted to be handled and transported, i. e. which are used by a user as ball-point pen, roller ball, felt pen or fountain pen; writing instruments with ink devices or refill cartridges are also comprised.

Many decades ago, efforts were made to provide the tip shape of a writing instrument at
10 the front end of a shaft with a shape tapered towards the front end and to simultaneously incline the tip in relation to the axis of the writing shaft, compare the old documents **FR 1,032,122 A** (Segal/Flicker), **FR 2,151,240 A** (Droubay) or the old German document **DE 871 258 C** (Riepe-Werk).

15 Only in recent years, the concept has been taken up again to improve the idea of an inclined writing tip with regard to industrial engineering, said obviously outdated idea having disappeared from the catalogue of ideas of the manufacturers of writing instruments, see for example documents **WO 98/13216 A1** (Senator/Vial) or
20 **WO 97/22482 A1** (Gillette). Whereas the last mentioned WO-document relates to a tip design as described in the first mentioned FR-document, namely designing the front end as a double curvature of a tip device tapered towards the front to obtain an orientation directed away from the writing surface on one hand, and on the other hand,
25 very close to said tip device, an orientation directed towards said writing surface again, the last but one WO-document by Vial proposed to provide a writing tip inclined in one direction only, an elongated design of a front end being selected as an inclined or "asymmetrical" cone at the front shaft end. Such a design permits to improve the control by the user who has a better view of the writing end of the writing instrument due to the slim elongated tip.

30 The modernization in the field of technical engineering according to the preceding paragraph concerned a stationary tip inclination. Already many years ago, an adjustable tip arrangement according to **DE 801,614** (dating 1951, Ganter) was proposed in which a ball or disk joint relative to a schematically indicated tip was provided, said tip having been mounted at a shaft with a nut (designated d there) after adjusting said ball-disc
35 joint. Still earlier, in 1928, a writing instrument was proposed in **US 1,687,647** (Garvey), said writing instrument permitting a very closely limited tip inclination, oriented at an axially arranged "rigid tip holder 10" as described therein and releasing the flow of a writing medium upon being slightly bent. Upon bending, the user adjusts the rate of flow

sleeve portion of said shaft between an adjusting means displaced towards the front end and said terminal part.

Said adjusting means may have a sleeve-shaped structure and may be connected with at least one thread portion to the front or to the rear shaft part – in case of a divided shaft -, the distance of said connection being variable.

The preceding ideas may be combined optionally, e. g. an adjusting sleeve (claim 6b,22) close to a pivotable tip device and a writing instrument with a closed rear terminal part; the same with a push button provided at the terminal part, for operating a refilling device and releasing said refilling device (writing position/retracted position); an adjusting means (claim 6a,22) located at the terminal part comprising a separate push button for moving said refilling device in a writing position or in a retracted position; the same with a writing utensil comprising a closed terminal part.

Advantageously, an axial pre-tensioning is used (claim 21), said pre-tensioning being applied on said refilling device over a spring means, mostly a cylinder spring. On one side, said spring means is supported at said writing instrument, on the other side it contacts said refilling device. When said axial spring is located in the front portion of said refilling device, it contacts said pivotable tip device and urges said refilling device backwards against a closed shaft end or against a push button for axially moving said refilling device against said spring force. Thus, a coupling of said refilling device and said tip device (claim 16,20) may be neutralized by spacing a shoulder of said refilling device from said contacting position at the backwards facing end portion of said tip device. When said spring means is located at the rear end portion of said shaft, it urges said refilling device towards the front, the term "urging" being equivalent to an axial pre-tensioning. The last mentioned embodiment of use may also be applied with a writing instrument with refilling cartridge, said instrument having a closed shaft end or a terminal push button part.

Said spring means may have a double function, namely pre-tensioning said refilling device with respect to a push button means, and a follow-up function of said refilling device when changing the inclination of said tip device upon influencing said writing instrument over an adjusting mechanism and said adjusting mechanism effecting said change of said tip inclination "(directly or indirectly) starting out from said terminal part".

A coupling portion of said refilling device (claim 16) with the rear portion of said tip device is laterally offset in relation to a bearing portion, at which said tip device is supported to be pivotable (claim 5,8).

For improving a guiding in a pivoting plane, said tip device may be guided on two sides extending in parallel with respect to said plane, said guiding being effected from said shaft by protrusions extending towards the front (claim 7). Preferably, said tip device is flattened to provide a larger contact surface at said protrusions.

A leaf spring additionally provided at the rear end of said tip device, which spring may be located on the opposite side of the described bearing, provides an increased dynamic effect upon pivoting said tip device to be more inclined, said dynamic effect resulting from a contact of said leaf spring with the inner shaft wall. Thereby, a returning torque is achieved even when no refilling device with elastic portion is provided, so that a writing instrument not having a refilling device also has a tip with a substantially straight orientation, in which writing instrument a refilling device may simply be inserted from the rear, said refilling device being controllable itself in its longitudinal movement by said terminal part and releasing an inclination movement of said tip over the described contour control.

When an integral arrangement comprising a tip tapered towards its front end and a shaft is used, said bearing may be provided by an elastically flexible transition, whereas in the remaining portion, said tip is uncovered from said shaft and variable with respect to its inclination; in this case, said elastic transition constitutes said bearing position permitting said inclination movement; e. g. a thin hinge or plastics hinge joint.

A control is not only possible (starting out) from said shaft, it may also be effected directly over a control ring, particularly close to a pivotable head, said control ring being arranged around said shaft and accessible to the user for effecting said control (claim 1).

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increasing inclination, said tip continues to protrude out of said tip device in the same manner.

When using a spring arranged at the front end, which spring urges said refilling device
5 back and is adapted to space said tip device from a control shoulder portion of said
refilling device by applying an elastic tension force, a dimensioning basis may also be
given here (claim 25). Said elastic pre-tensioning between the two components
described resulting in that said tip device is urged in a more inclined position, a
10 returning spring at an edge of said tip device has to take care that said torque is at least
compensated and that an additional torque is applied, permitting a return of said tip
device, when a smaller inclination is desired by operating said adjusting means at said
shaft.

A non-interaction of a change of said refilling device and an adjustment and
15 maintenance of a certain inclination of said tip device is particularly preferred. Thus, a
user may adjust his preferred inclination angle which he does not loose even when
providing said writing instrument with another or a new refilling device. For such an
embodiment, a combination of an adjusting means at a terminal shaft part in connection
with a divided housing shaft is advantageous. A control at said terminal part is
20 independent of a shaft being divided by unscrewing for changing said refilling device.
Both functions of said writing instrument are accomplished simultaneously and are
independent of each other.

The claimed invention is described and supplemented by **embodiments**.

Figures 1 comprise three illustrations showing an embodiment of a writing instrument having a pivotable tip device, which in this embodiment is designed as a cone 10.

Figures 2 show in two sectional illustrations the embodiment of figure 1, with a conical tip device being in a straight position and an conical tip device being inclined by engagement of a refilling device 40 at a rear control portion 9 of said conical tip, said tip being pivotable at a joint 13, 14, 23.

Figures 3 comprise four illustrations A to D, showing the design of a conical tip device 10 comprising control portions 9, 9a, 9b at the backward facing portion as well as further elements for improving the functionality of the variable inclination of said tip device 10.

Figures 4 comprise four illustrations A to D, showing the design of a shaft 20 in a sectional view in two sections offset by 90° as well as in two axial views.

Figures 5 illustrate a number of embodiments A to D for mounting a terminal part 50 at a rear shaft end 20.

Figures 6 show three illustrations of a writing instrument with a divided shaft 64 comprising a front portion 64' and a rear portion 64" being connected to each other over a sleeve 63 located outside thereof and being provided with a distance 25 controllable over said sleeve and in an axial direction. The writing instrument according to figures 6 is closed at the rear shaft end.

Figures 7 comprise four illustrations showing a retracted position and an extended position of a writing instrument having a movable refilling device 40, two different positions of a pivotable tip device 10 with a refilling device extended in a writing position being also shown.

Figure 8 shows two illustrations of a writing instrument without a push button portion and having a closed end 20b comprising an extended leaf spring means 17, said leaf spring, in connection with a part 20c of a shaft 20, serving for varying the inclination of a tip device 10.

Figure 1a shows writing instrument illustrated in a top plan view, which writing instrument in a side view according to **figure 1b** has a straight orientation, and in a side view according to **figure 1c** has an inclined tip device 10, said inclination being at an angle α relative to a shaft 20, in this embodiment shown at substantially 15°. Two marked axes 100 and 101 serve for orientation, said first mentioned axis being a main axis of said shaft 20, also constituting an axis of said writing instrument, said last mentioned axis being an axis of said tip device 10, which in the inclined illustration, in which said two axes include an angle of 15°, has changed its inclination in a paper plane. Said inclination is variable between 0° and α_{\max} .

At the front end of said conical tip device 10, which has an opening 29 at said front end, a writing tip 30 protrudes, said writing tip changing its inclination simultaneously with the inclination of said cone 10.

As far as the functionality of the writing instrument is concerned, reference is made to **figures 5** with regard to the terminal part 50 of figure 1. As far as a more exact design of said shaft 20 also with its front guiding protrusions 21, 22 is concerned, reference is made to **figures 4**. **Figures 3** show a more detailed illustration of said tip device 10. The operation or the pivoting possibilities, particularly the application of returning forces on said conical tip result from figures 2.

Figures 2 illustrate the writing instrument of figure 1 in a sectional view, however, in this embodiment a refilling device 40 being provided in said shaft 20, said refilling device being supported at the backwards facing end at said terminal part 50, and comprising a writing tip 30 at the front end, a channel portion 41, 42, which has a considerably smaller diameter, leading into a step or shoulder portion 43, having a diameter corresponding to a so-called "high capacity" or "large volume" ink device or cartridge for storing a writing liquid. The embodiment illustrated thus shows a roller ball or a ball point pen, however, it may have the same design for corresponding other shapes of refilling devices, such as felt tip pens or pens.

Supposed that said ink device 40 moves in a longitudinal direction x, in parallel to said main axis 100, and over a small distance in a forward and a backward direction, said front step or shoulder 43, as an annular surface at a contact position with the rear end of said conical tip 10 transfers a pivoting movement on said tip, when said tip is arranged to be inclinable, tiltable or pivotable at a bearing L offset with respect to said axis 100. Said bearing comprises two opposite protrusions, one being located at the front end of said shaft and at the inside thereof, the other being arranged at an outer

and backwards facing end of said conical tip, so that said two protrusions form a bearing portion L or 23 for a conical tip device 10 being inserted from the rear, around which bearing said tip device 10 is pivotable.

- 5 Said pivoting movement is initiated by the described longitudinal adjustment of said ink device 40. Said shoulder 43 is in contact with a contour control portion 9 comprising two webs at the backward facing end of said tip device, which webs may have a semicircular or a straight shape. In a direction perpendicular to said main axis 100, said webs have a spherical shape or comprise two web pieces, each of which having a
10 straight extension, but at an angle differing from 180° . Said inclined extension 9a,9b corresponds to a substantially desired maximum inclination of said cone 10, so that an angle β illustrated on figure 3 substantially corresponds to said angle α_{\max} of figure 1.

- Upon inclining said tip, an elastic portion 42 of said refilling device bends out under
15 application of a returning force, so that, upon a returning movement of said refilling device, said tip reduces its inclination achieved before. Additionally, a leaf spring 17 may be inserted into a recess 16 in said tip device, said leaf spring starting to apply returning forces relative to the inner wall of said shaft 20 upon an increasing inclination.

- 20 Two laterally protruding limiting means 12 are provided, said means being offset by $\pm 90^\circ$ in relation to said bearing portion 23 and providing a limiting position of said tip device 10 at further limiting means 21a,22a, located correspondingly inside said shaft and at a forward facing end thereof, said limiting means 21a,22a being visible on figure 4. When said conical tip device 10 reaches its maximum inclination, said two
25 noses contact said protrusions 21,22a and limit a further pivoting movement; at said state of inclination, the shoulder 43 of said refilling device 40 is also in a plane-parallel contact with said portion 9b of said inclined contour control 9.

- For improving the function of said bearing 23, 14, 13, said conical tip device 10 is
30 provided with a flattened portion 15 in the area of said bearing portion, said flattened portion having a heraldic- or blazon-shaped design and an edge oriented towards the rear and having a substantially straight extension, from which edge said protrusion 13 at said conical tip 10 originates.

- 35 A lateral control of said cone 10 is improved, when two protruding guiding plates are arranged in an axial direction 100 at two sides offset by 180° , each offset in parallel with respect to a plane in which the inclination movement is effected. They act together with corresponding flattened portions 11 at said tip device 10 for obtaining a bilateral guiding

on the left and on the right of said bearing portion 23. Said plates protrude in a semi-oval shape from said shaft 20 and are visible on figure 4 as plate pieces 21 22. The corresponding flattened portions 11 at said tip device 10 are illustrated in figure 3.

5 A number of embodiments for realizing a terminal part 50 are accessible to the expert on **figure 5**. An embodiment of realizing a longitudinal movement x of a refilling device 40 is to provide said terminal part 50 as a stopper or plug which is guided in a thread by one or two opposite spherical protrusions 51, so that a rotary movement of said plug or stopper 50 effects its longitudinal movement. Said longitudinal movement is
10 transferred to said refilling device 40, which for its part changes the inclination of the tip over said contour control 9 and maintains said inclination in said changed position, thus controls it.

Alternative embodiments may be realized by providing said plug or stopper 50 with an
15 annular recess 54a in a cylindrical portion 50a, in which recess an O-ring 54 is located, which O-ring slightly protrudes in a radial direction and engages in said thread.

A further – not illustrated – alternative is to provide said terminal part 50, which is only adapted to be rotatable at said rear shaft end, with a surface inclined towards the front,
20 said surface being adapted to transfer longitudinal forces to said refilling device 40, upon being rotated and contacting said refilling device 40.

When said shaft has an integral design, said tip device, for assembling purposes, may be inserted into said shaft 20 from the back side thereof. When said shaft is divided in
25 two parts – said embodiment being described further below -, the dividing position offers itself as an inserting position, when said two shaft parts are detached from each other and separated.

A terminal part according to figure 5 is provided with protrusions 51, which, according to
30 illustration C may have a line-shape. They may also be locked in corresponding lock-in positions 52 at the inside of said shaft for fixing predetermined positions upon a rotary movement, said positions corresponding to defined angle positions α of said tip device. When said protrusions are designed to have a substantially punctual shape, they are suited as a thread engagement. Both elements may also be combined, said combined
35 application being symbolically represented in illustration D, according to which only said protrusions 51 in said thread and only said lock-in position 52 (with protrusion 51) without said thread, respectively, are also realizable.

A stripe-shaped web 50 protrudes in an outward direction, at which web the rotary movement for said terminal part 50 is effected.

The force of a spring 17 according to figure 3 has to be adjusted such that the returning force is sufficient, if necessary in combination with a compressive stress of an elastic portion 42 of a channel section at the front end of said refilling device. A contact position of said leaf spring 17 should be offset to the rear, in relation to a bearing position L, for allowing a torque to be applied with a lever arm on a tip device 10, even when said tip device 10 is bent out or inclined.

Figure 6 illustrates a divided writing instrument having a shaft 64 consisting of a front portion 64' and a rear portion 64". Said two shaft portions are coupled to each other by a tooth-shaped engaging means comprising a web 22 and a groove 21, said coupling being adapted such that they are not able to rotate relative to each other, but are variable in an axial direction with respect to their distance from each other, by forming a varying interspace 25. A sleeve structure 63 is provided to have such a length that it extends over both edge portions on both sides of said interspace 25 and that it comprises a thread portion on at least one of said two sides 63a cooperating with a corresponding counter-thread 62a or 64a at a respective shaft part 64' and 64". One of said thread portions may be dropped and be replaced by a guiding means only providing a rotary movement at an axial immobility on said one shaft part, whereas the other shaft part is adapted to be varied in its distance by said thread connection 63a/64a by varying a gap 65. When said distance changes, the length of said shaft and said writing instrument, respectively, changes, and when a refilling device 65 is inserted, also the relative position of said refilling device changes relative to said bearing position L, causing a pivoting movement of a head 10 having an opening 10a, through which opening said tip 65a protrudes at a front channel portion 65b. A step 65c, comprising a shoulder means 66d, provides a transition from a front portion of said refilling device to a reservoir of said refilling device, and provides a contact to said contour control 9 which was described before.

Also a leaf spring 17 is also present for providing a returning pivoting torque for said tip 10, when an elastic portion 65e of said refilling device is not sufficient for applying said returning force. However, said returning pivoting torque may only have an effect when a smaller gap 25 of figure 6c is enlarged again to a normal gap 25 according to figure 6b.

Said control sleeve may be arranged at any position of said writing instrument, upon correspondingly displacing said gap or slot 25. Figure 6a may also be provided with a push button means at the rear end of said shaft, so that the refilling device is adapted to be retractable and extendable.

When two pairs of threads 63a/62a and 63a/64a are used on both sides of said gap or slot 25, they are provided with an opposite pitch, and said sleeve part 63 has a corresponding female thread.

Figures 7 illustrate a writing instrument, showing two retracted positions of said refilling device in figures 7a,c and two extended positions according to figure 7b,7d. A push button portion 35 changes the position of said refilling device, the design of the tip device and the bearing L being similar to that described before with reference to the figures. Additionally, an axial spring is arranged, being in contact with the front portion of a tapered channel of the tip opening and also with a shoulder according to 66c of figure 6b, for spacing said shoulder 43 from said contour control 9 in a retracted position.

Said shaft has a short rear portion 33 carrying a push button means 34, said rear portion being screwed with a thread into a rear portion 20a of the remaining shaft and being variable in its position by a screwing movement. A distance x1 is shown, said distance being changeable by a screwing movement to a distance x2 of figure 7c. When the push button is actuated at an adjusted distance x1, said shoulder 43 just contacts said contour control 9, so that no inclination of the tip is effected. Starting a rotary movement of said portion 33 now, changes the inclination of said tip 10. A change of said distance to x2 may also be preselected before actuating said push button, so that the tip inclination then desired is effected upon actuating said push button according to figure 7d, in the course of actuating said push button and advancing said refilling device and coupling said shoulder 43 with said contour control 9.

An instantaneous or momentary pivot point and said bearing L are provided as described above.

Said thread connection at the rear portion may also be displaced further to the front, being at least at a distance from the front end of said shaft. A guiding of inner webs between said parts 34,33 and the push button control 35 are designed like a usual ball point pen mechanism. By actuating said push button 35, said inner part 34 is locked in different axial positions.

Figures 8 comprise two illustrations of a writing instrument having a closed end 20b, an axial position of a rear shaft part 20" being changed relative to a front shaft part 20', said change being effected by a connection having a thread pitch 20w. Said shaft is divided
5 in two parts, the dividing position according to this embodiment being located at a front third part, but it may also be connected to be rotatable at another position, particularly at a position closer to the tip end 10. Similar to adjusting a distance x_1, x_2 , a distance y_1, y_2 is adjustable in this embodiment for controlling a tip inclination 10 from a shaft. A bearing L is the pivoting point of said tip 10. A control effected over said coupling
10 portion 9 and a shoulder 34 by a counter torque applied by a leaf spring 17 and an elastic channel part 42 of said refilling device allow a returning movement of said tip device 10 upon increasing a distance 27.

According to this embodiment, a front end 20c of a rear shaft part 20" is adapted to
15 contact an extended leaf spring 17', said leaf spring closely contacting said shaft and its inner wall and extending in backward direction. Advancing said end 20c causes a direct mechanical coupling of a force, said force initiating a tip inclination 10 relative to said bearing portion L with the corresponding lever arm. Said lever arm being twice as long in relation to effecting a tip inclination by said axis 100 of figure 1, an increased length of
20 stroke y_1 is provided, which is substantially $y_1, y_2 = 2x_1$.

Said double stroke of said refilling device 65 for achieving the same angle of said tip device 10 is compensated by a spring 41b between said closed end 20b and an end of said refilling device 65. Said spring urges said refilling device 65 further to the front,
25 when said distance 27 is increased, thus maintaining the contact or the coupling between said shoulder 43 and said coupling portion 9. A pressure on the refilling device caused by writing is absorbed by said spring 41b, such that practically no axial displacement occurs and the refilling device protrudes out of said tip device at an equal length, independent of the writing pressure and the angle position. A compensation of
30 the writing force thus effected is over-compensated by returning moments of said portion 42 and said spring part 17 with said extension 17', so that an increase of said distance y_1 by said increased returning moments also causes a reduction of said inclination angle 10.

* * *

Claims:

1. **Writing instrument** comprising a substantially sleeve-shaped shaft (20), a main axis (100), a terminal part (50,35,20b) at a rear end of said shaft, and a substantially conical tip device (10) at a front end portion of said shaft (20), characterized in that one of
 - said tip device (10) being adapted to be controlled (40,43,9) pivotable (inclinalable) in a plane comprising said main axis (100) and relative to said sleeve-shaped shaft (20); *and*
 - an inclination angle (α) of a cone axis (101) of said tip device (10) being adjustable (40,43,9) in relation to said main axis (100).
2. Writing instrument according to claim 1, said inclination (α) of the tip being changed from the terminal part (50,35,20b), particularly providing a longitudinal movement of an ink device or a refilling device (40) received in said shaft, said movement being effected in a longitudinal direction (x) and relative to a socket or bearing (23;13;14;L) between said tip (10) and said shaft (20).
3. Writing instrument according to claim 1, wherein a refilling device (40) as ink barrel, comprising an elastically flexible portion (42) at a front end thereof, said portion changing its deflection, particularly also its bending stress, upon changing said inclination angle (α).
4. Writing instrument according to claim 3, wherein, at its front end, said elastically flexible portion (42) is adapted as a writing tip (41,30), said writing tip protruding through a front end opening (29) of said tip (10) to make use of said bending stress of said elastically flexible portion for effecting a returning force on said tip (10) having said adjustable inclination angle.
5. Writing instrument according to claim 1, wherein said tip (10) is pivotably received at a bearing portion (13,14;23;L) at said shaft (20), particularly said bearing portion (L) being located outside of said main axis (100) or only one single bearing portion (13,14) being provided in the area of a sleeve wall of said shaft (20), said bearing portion also constituting a pivoting axis for varying the inclination angle of said tip.

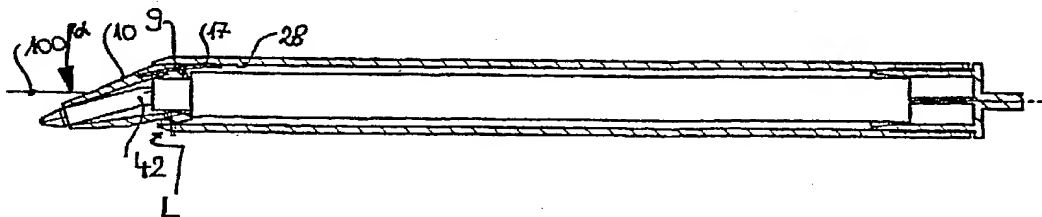
6. Writing instrument according to one of claims 1 and 2, wherein said shaft (20) is divided at a dividing position (25,26,27) and adapted to allow a distance (x_1, x_2 ; y_1, y_2) of two shaft parts (20',20'') to be varied, wherein particularly one of
 - (a) at least one thread element is provided for connecting said two shaft parts (20a,33) variably with respect to their distance from each other; and
 - (b) an adjusting sleeve (63) is provided, for connecting two shaft parts (64',64'') variably with respect to their distance from each other, said connection being non-rotatable, but movable in a longitudinal direction (21,22).
7. Writing instrument according to one of claims 1 and 5, wherein guiding means (21,22) are provided, said guiding means extending in a parallel direction with respect to said pivoting direction and being located at the front end of said shaft (20), particularly at a distance from said main axis (100) and on both sides thereof, for guiding one of said controlled pivoting movement and said adjustment of the inclination angle (α) of said tip (10), said tip preferably being flattened (11) in an area of said guiding means (21,22), for blocking a lateral tilting in a transverse direction with respect to said plane comprising said main axis (100).
8. Writing instrument according to claim 5, wherein a coupling portion (9;9a,9b) is provided at an end portion of said tip (10), said portion being offset in relation to said bearing portion (13,14;23;L) in said plane comprising said main axis.
9. Writing instrument according to one of claims 1 and 4, wherein a leaf-shaped spring (17) is provided at a backwards facing end portion of said tip (10), said spring extending into an inside of said shaft (20), for contacting an inner wall of said shaft and for effecting resetting forces upon an increase of inclination of said tip (10).
10. Writing instrument according to claim 1, wherein, on its edge, said tip (10) comprises limiting means (12), for limiting maximum inclination portions by contacting protrusions (21a,22a) located at the inside of said shaft, particularly such protrusions which are provided directly (integrally) with guiding means (21,22) for laterally guiding said conical tip (10).
11. Writing instrument according to claim 1, wherein said tip (10) is received (23,13;L) at the inside and at the front end of said shaft, said tip (10) being particularly adapted to be inserted into said shaft (20) from the rear end thereof.

12. Writing instrument according to claim 1, wherein said tip (10) has an elongated extension, the length of said tip being larger than a diameter at the rear end of said tip, particularly more than one and a half times as large.
- 5 13. Writing instrument according to one of claims 1 and 12, wherein said tip (10) has a conical shape and is adapted to be symmetrical with respect to a cone axis (101).
14. Writing instrument according to claim 1, wherein said terminal part (50) of said shaft is one of rotatably received (50a,51) in said shaft end, particularly in a thread element having an inclination angle, and provided with an inclined surface at its
10 front end, for one of controlling and adjusting a longitudinal movement (x) of said refilling device (40) according to claim 2.
15. **Writing instrument** according to the introductory part of claim 1, characterized in
15 that said tip device (10) is of an elongated shape and has a cone axis (101), said cone axis being variable in its angle (α) relative to said main axis (100) of the writing instrument.
16. Writing instrument according to one of claims 1 and 15, wherein said tip
20 device (10) comprises a rear end portion (9;9a,9b) cooperating with a shoulder portion (43,66b) of a particularly integral refilling device (40), for providing a contour control for the change of inclination of said tip device.
17. Writing instrument according to one of claims 1 and 15, wherein a contour control
25 means (9) is provided at said tip device, said control means comprising at least one, particularly two laterally spaced web segments, one of them comprising two web portions (9a,9b) extending to form an angle (β) of less than 180° , particularly between 160° and 180° , for controlling the inclination of said tip device.
- 30 18. Writing instrument according to claim 14, wherein said terminal part (50) of the shaft is rotatably received in said shaft (20), particularly being one of hardly turnable and provided with circumferential lock-in positions (52).

19. Writing instrument according to claim 17, wherein the kink angle (β) of said web portions (9a,9b) substantially corresponds to a maximum inclination angle (α_{\max}) of said tip device (10) relative to said main axis (100) of the writing utensil or the shaft (20).
20. Writing instrument according to claim 1, wherein said tip device is provided with at least one coupling means (9; 9a,9b) at its backwards facing end portion, a shoulder or step (43,66d) of said refilling device (40,65) being coupled to said coupling means, for applying forces on said tip (10), said forces controlling the inclination (α) of said tip device.
21. Writing instrument according to one of claim 15 and claim 6, wherein an axial refilling device (40,65) is provided, and wherein a first elastic force acts on said refilling device by an axially acting spring means (41a,41b), for axially pre-tensioning said refilling device one of towards said tip (10) and away from said tip (10).
22. Writing instrument according to claim 6, wherein one of said dividing position (26) being located close to said terminating part (35) of said shaft and said dividing position (25) being located close to said tip device (10).
23. Writing instrument according to one of claim 1 and claim 15, wherein a length of one of said shaft (20;20';20'') and said writing instrument (10,20,35,33) being varied upon or for varying said inclination angle (α) of said tip device (10).
24. Writing instrument according to one of claim 1 and claim 15, comprising a refilling device (65) being tensioned by a compression spring (41b) such that said refilling device is urged against said tip (10), said compression spring being dimensioned such that it receives/absorbs writing forces without substantially changing the position of said refilling device (65), but effects a smaller torque on the tip (10) than a returning force of a further elastic means (42,17), said means being also coupled to said tip (10) to allow it to be pivoted back into a straight position with respect to said main axis (100).

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**INTERNATIONALE ANMELDUNG VERÖFFENTLICHT NACH DEM VERTRAG ÜBER DIE
INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT)**

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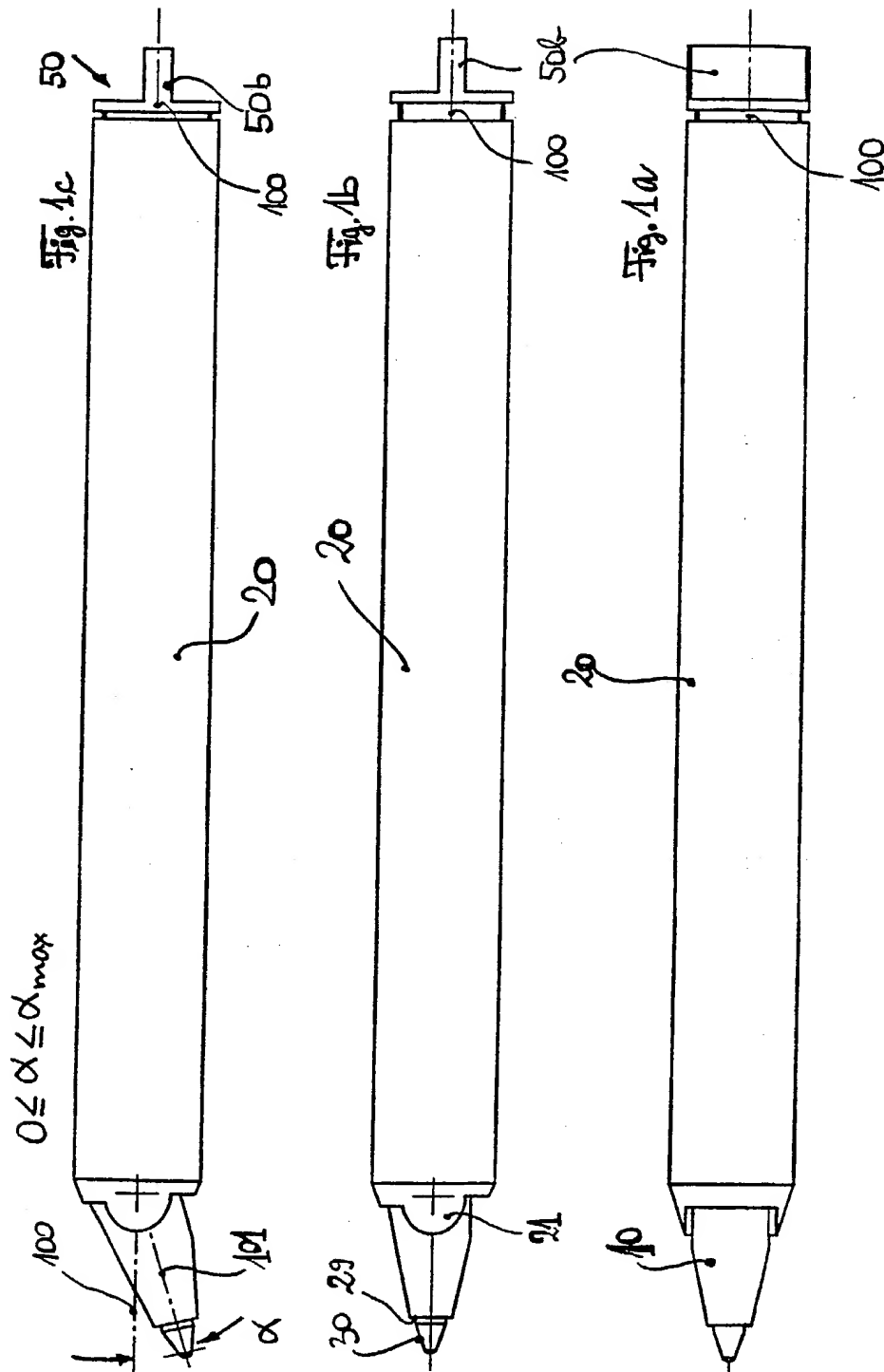
(54) Title: WRITING INSTRUMENT WITH VARIABLY INCLINABLE TIP
(54) Bezeichnung: SCHREIBGERÄT MIT NEIGUNGSVARIABLER SPITZE

(57) Abstract

The invention relates to writing instruments which are ergonomically adjusted to the position of a user's hands. To this end the invention provides for a writing device comprising a substantially tubular shaft (20) and a main axis (100), a terminal part (50) at the rear end of the shaft and a substantially conical tip (10) at the front end of the shaft (20). The tip (10) can be pivoted (inclined) in a controlled (40, 43, 9) manner in relation to the shaft (20) in a plane containing the main axis (100). Alternatively, an angle of inclination (α) of a cone axis (101) of the tip (10) can be adjusted (40, 43, 9) in relation to the main axis (100).

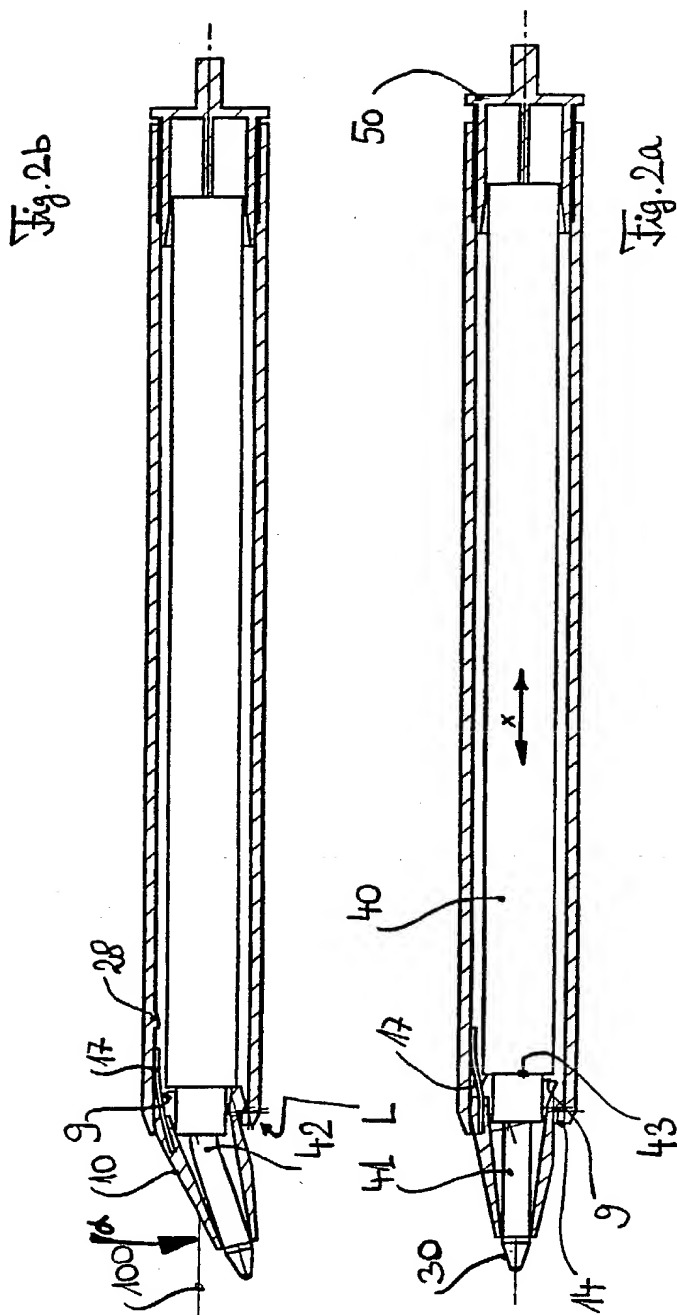
(57) Zusammenfassung

Die Erfindung befaßt sich mit Schreibgeräten, die ergonomisch an die Handhaltung eines Benutzers angepaßt sind. Vorgeschlagen wird dazu eine Schreibeinrichtung mit einem im wesentlichen rohrförmigen Schaft (20) und einer Hauptachse (100), einem Schaftabschluß (50) am rückwärtigen und einer im wesentlichen konischen Spitze (10) am frontseitigen Ende des Schaftes (20). Die Spitze (10) ist gesteuert (40, 43, 9) in einer die Hauptachse (100) enthaltenden Ebene gegenüber dem Schaft (20) verschwenkbar (neigbar). Alternativ ist ein Neigungswinkel (α) einer Konusachse (101) der Spitze (10) gegenüber der Hauptachse (100) einstellbar (40, 43, 9).

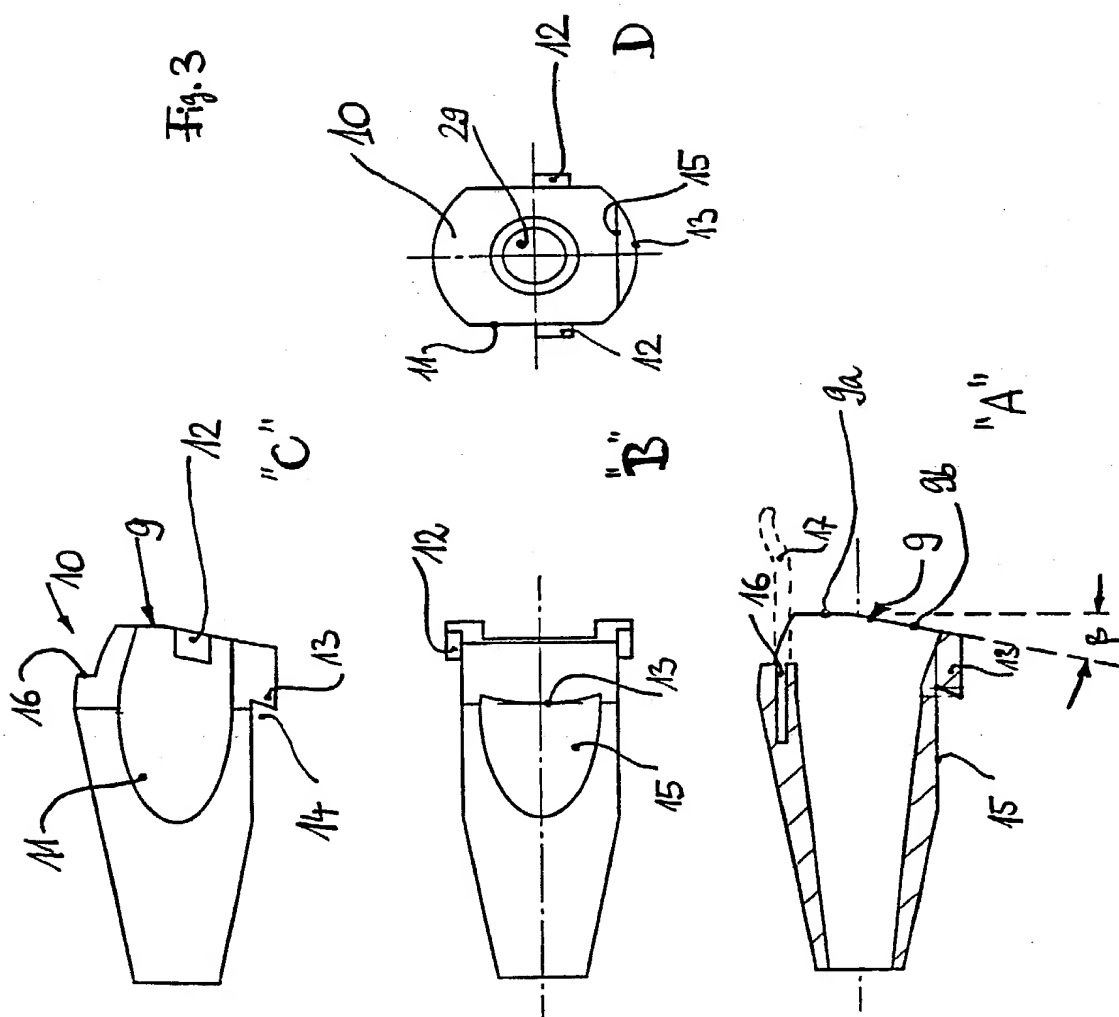
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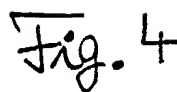


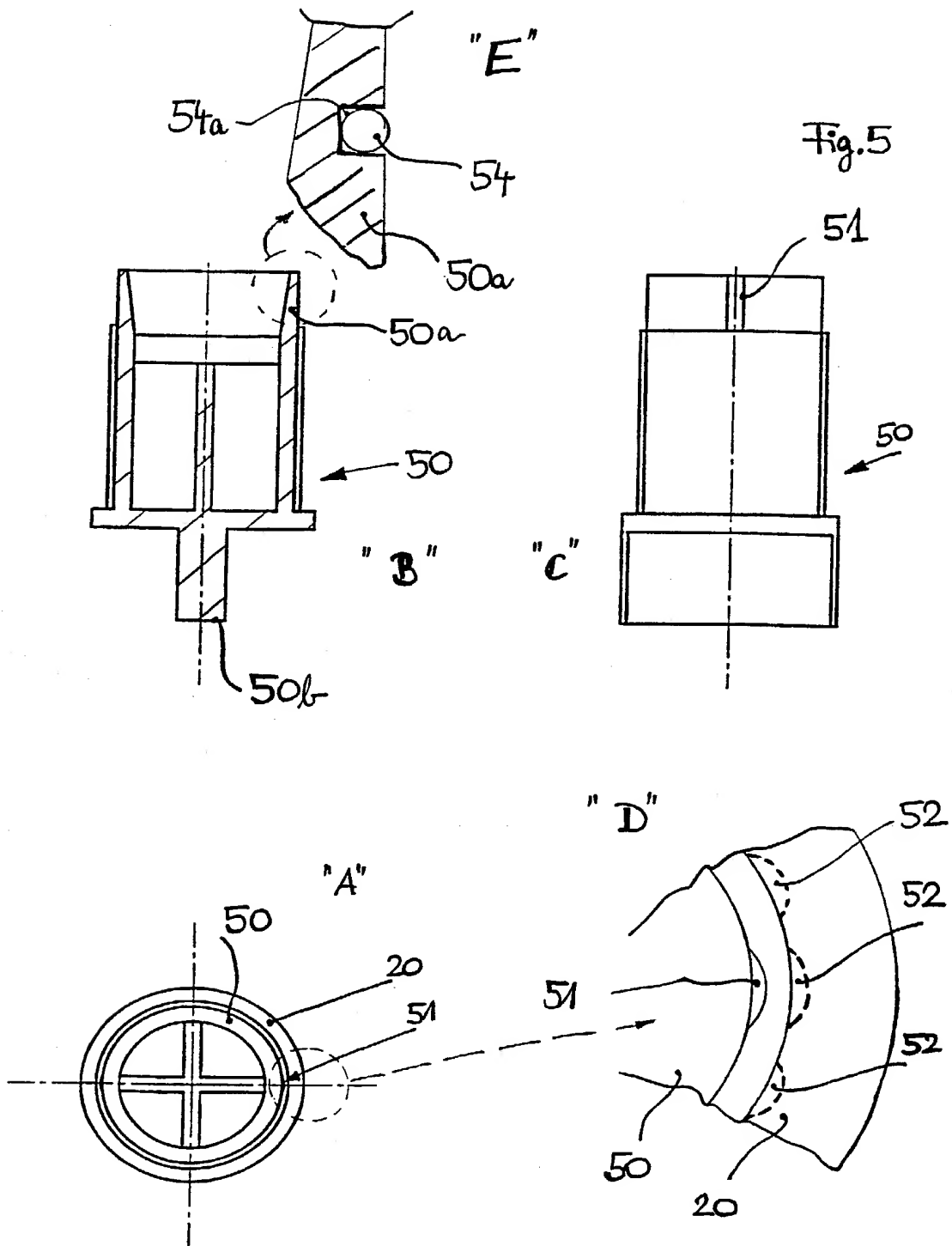
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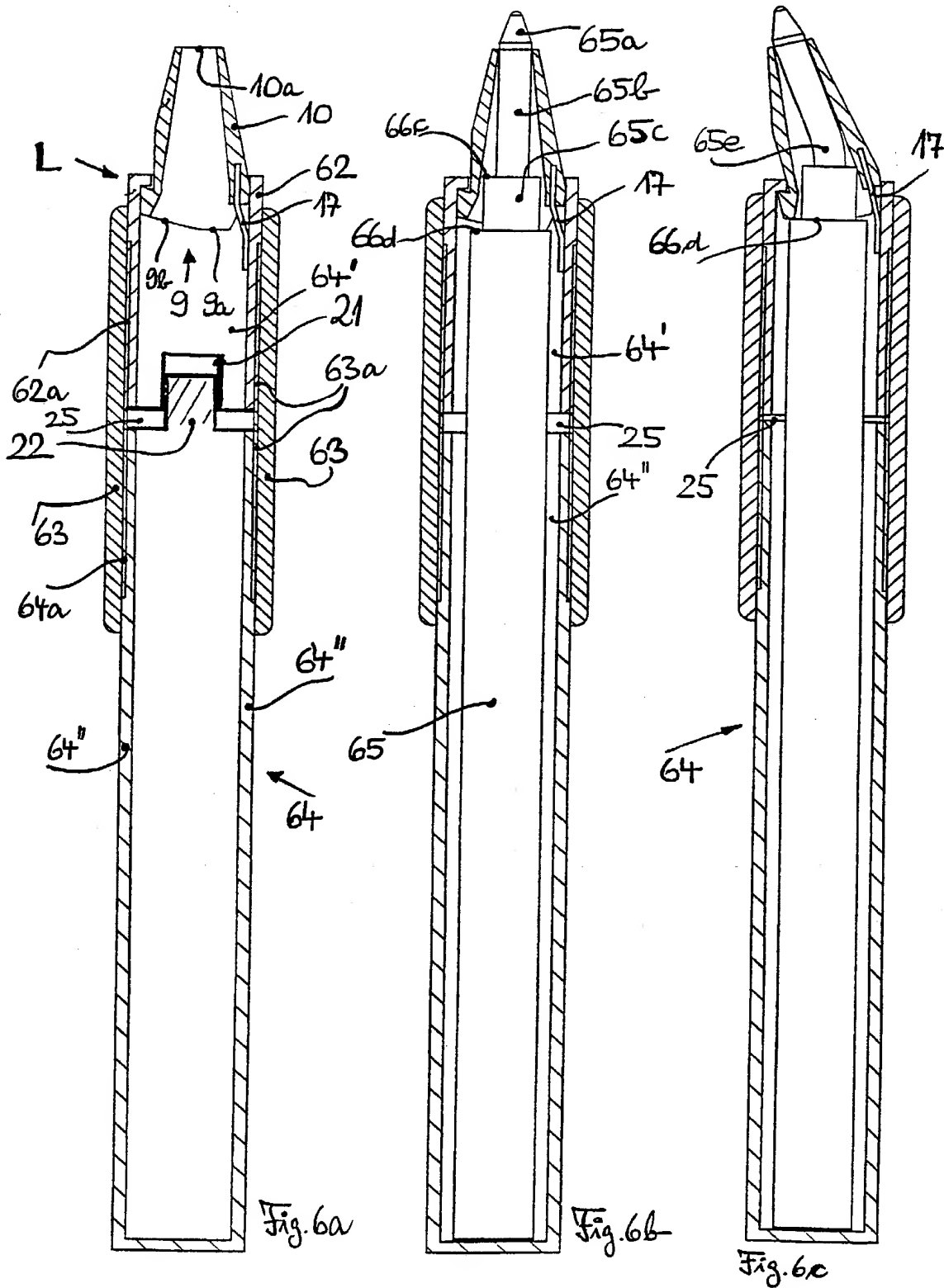
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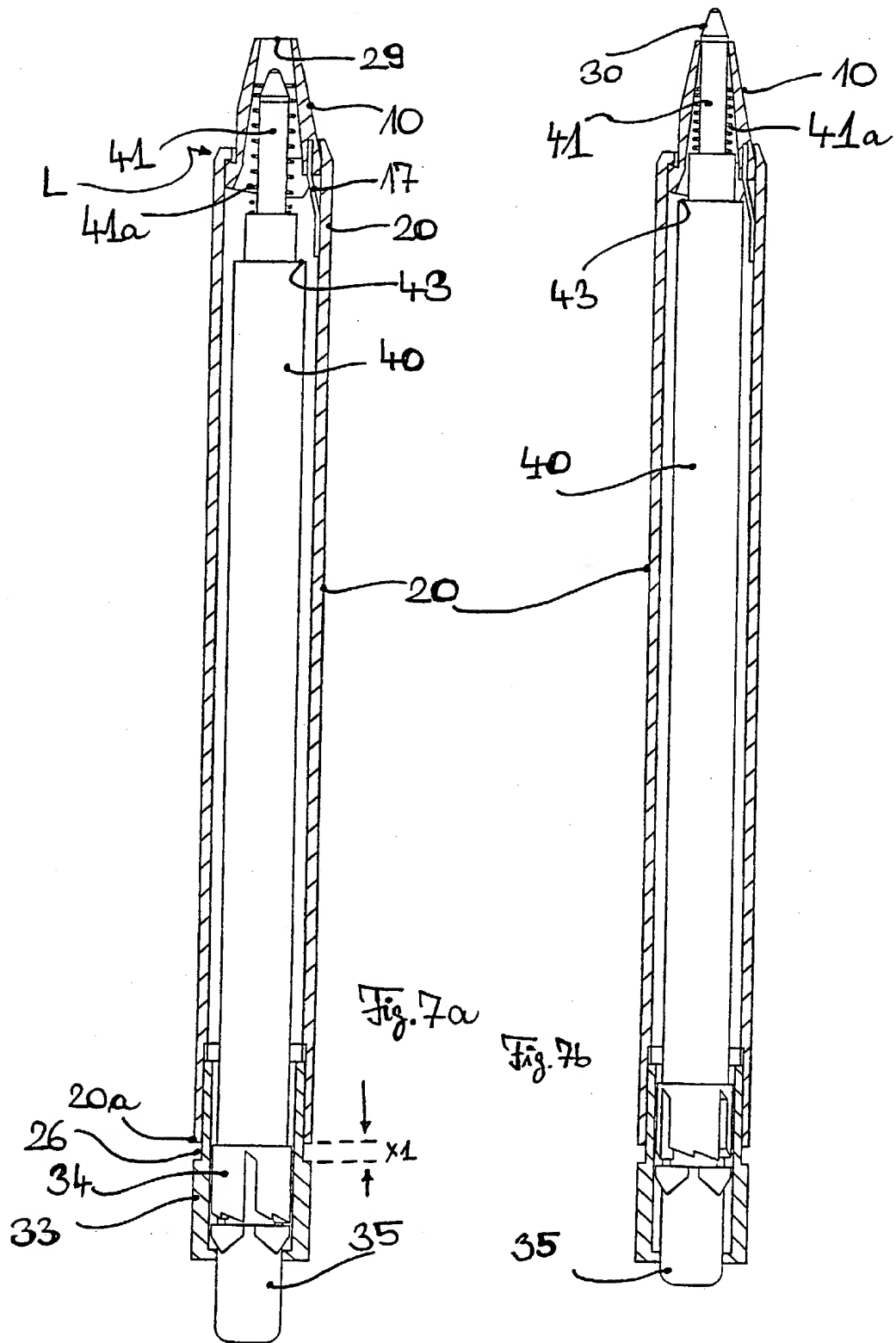




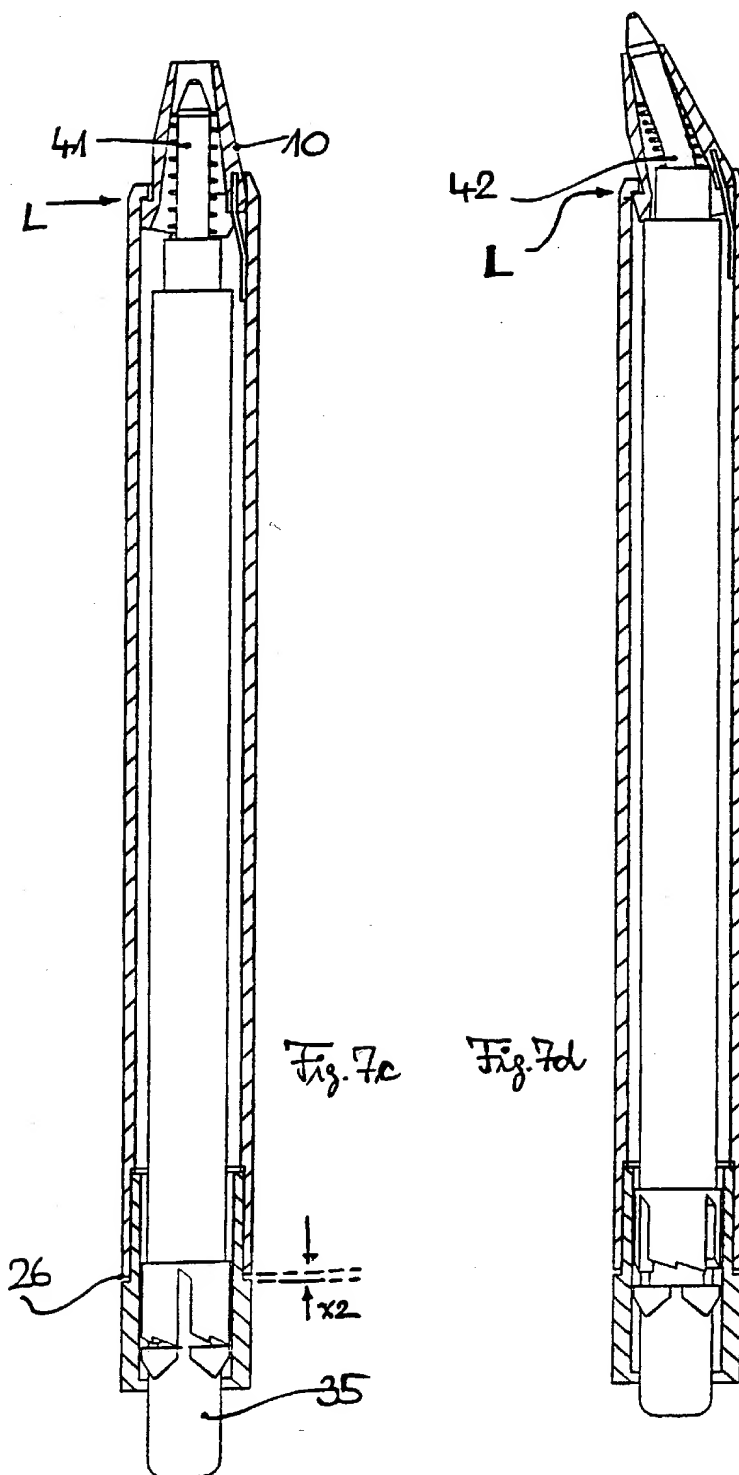


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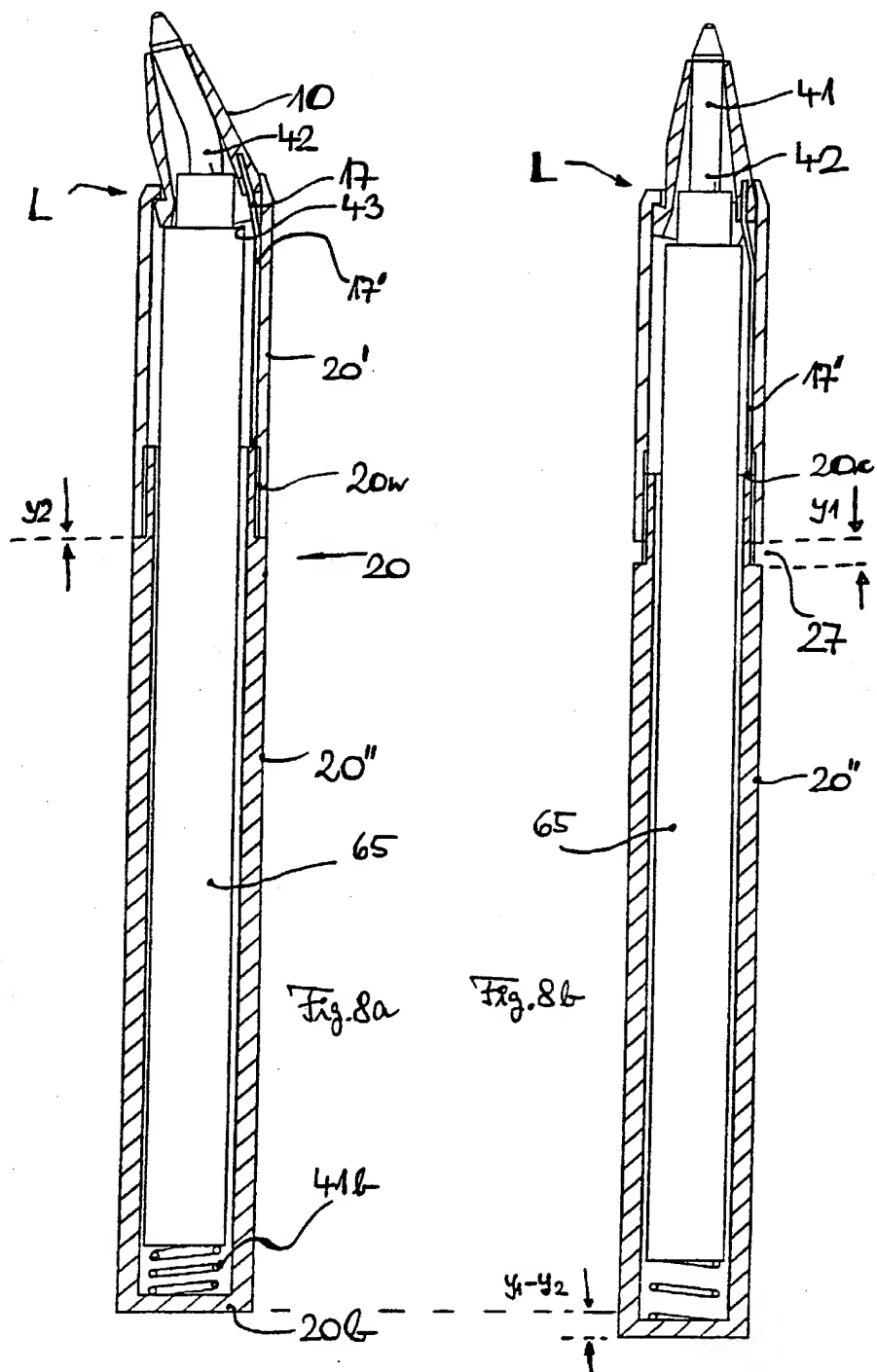




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of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

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no such applications have been filed.

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such applications have been filed as follows.

NOTE: Where item (c) is entered above and the International Application which designated the U.S. claimed priority check item (a), enter the details below and make the priority claim.

**EARLIEST FOREIGN APPLICATION(S), IF ANY FILED WITHIN 12 MONTHS
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Country	Application Number	Date of Filing	Priority Claimed under 37 U.S.C. 119
GERMANY	199 01 629.1	18/JANUARY/1999	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
INTERNATIONAL	PCT/EP00/00368	18/JANUARY/2000	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
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**ALL FOREIGN APPLICATION(S), IF ANY FILED MORE THAN 12 MONTHS
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POWER OF ATTORNEY

As a named inventor, I hereby appoint the following registered practitioners to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: otherwise known as Customer No. 08933

Lewis F. Gould, Jr., Registration No. 25,057; William H. Murray, Registration No. 27,218; Stephan F. Gribok, Registration No. 29,643; Peter J. Cronk, Registration No. 32,021; Robert E. Rosenthal, Registration No. 33,450; Richard A. Paikoff, Registration No. 34,892; Samuel W. Apicelli, Registration No. 36,427; Steven E. Koffs, Registration No. 37,163; N. Stephen Kinsella, Registration No. 37,657; Daniel S. Goldberg, Registration No. 39,689; Gail A. Dalickas, Registration No. 40,979; Darius C. Gambino, Registration No. 41,472; and, Anthony Colesanti, Registration No. 42,428.

Please direct all correspondence to: Lewis F. Gould, Jr., Esq.

DUANE, MORRIS & HECKSCHER LLP
One Liberty Place
Philadelphia, PA 19103
Telephone (215) 979-1283

DECLARATION

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the application or any patent issued thereon.

